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Code 1008.2, Naval Research Laboratory  
4555 Overlook Ave., S.W.  
Washington, DC 20375-5320

EXAMINER

BENSON, WALTER

ART UNIT	PAPER NUMBER
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2858

DATE MAILED: 12/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/816,148

**Applicant(s)**

THOMAS ET AL.

**Examiner**

Walter Benson

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 36-88 is/are pending in the application.
- 4a) Of the above claim(s) 36-53 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 54-84 and 88 is/are rejected.
- 7) ☒ Claim(s) 85-87 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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### **FINAL ACTION**

1. Amendment C, received on 9/17/03, has been entered into record. In this amendment, claims 54-88 have been added.
2. Claims 36-88 are now pending.

### ***Election/Restrictions***

3. Newly submitted claims 54-88 are the originally filed claims 1-35. Claims 36-53 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:
  - I. Group I, claims 36-53 are drawn to a sensor system with reference, measuring and electronic modules, to determine environmental conditions by measuring material degradation properties, classified in class 205, subclass 775.5.
  - II. Group II, claims 54-88 (original claims 1-35) are drawn to an apparatus and method where the non-electric property of an object is measured by an electrical property such as a voltage or current of a sensor, classified in class 324, subclass 71.2.
4. Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be

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separately usable. In the instant case, invention I has separate utility such as sensor system for electrochemical analysis. See MPEP § 806.05(d).

5. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 36-53 withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 54-58, 61, 62, 67, 68, 75-77, 81, 82, and 88 rejected under 35 U.S.C. 102(b) as being anticipated by Sabins (4,107,017).

A. With respect to Claim 54, Sabins teaches an apparatus comprising, a half cell (#16) measuring a potential of a tank, considered to be a hull, the measured potential indicating an amount of corrosion of the tank and the cathodic protection level of the tank (Col. 3, lines 33-34).

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B. With respect to claim 55, Sabins teaches the claimed anode (#20) measuring a current demand of cathodic areas of a tank, the current demand indicating the amount of corrosion of the tank and the level of coatings degradation.

C. With respect to Claim 56, Sabins teaches wherein the indicated amount of corrosion is in one of at least two different ranges (Col. 4, line 54-Col. 5, line 32).

D. With respect to Claim 57, Sabins teaches a polarization corresponding to the measured potential is used to determine the amount of corrosion of the tank and the cathodic protection level of the tank (Col. 2, lines 64-65).

E. With respect to Claim 58, Sabins teaches wherein the polarization is above a specific level indicating that the amount of corrosion is in a first range of the 25 one of at least two different ranges (Col. 4, line 54-Col. 5, line 32).

F. With respect to Claim 61, Sabins teaches an anode measuring a current demand of cathodic areas of a tank, the current demand indicating an amount of corrosion of the tank (#20).

G. With respect to Claim 62, Sabins teaches wherein the indicated amount of corrosion is in one of at least two different ranges (Col. 4, line 54-Col. 5, line 32).

H. With respect to Claim 67, Sabins teaches an apparatus comprising, half cells (#16) measuring a potential which corresponds to a polarization of a tank, and an anode (#20) measuring a current demand of cathodic areas of a tank, the polarization and the measured current demand together indicating an amount of corrosion of the tank and the level of coatings degradation (Col. 3, lines 33-34).

I. With respect to Claim 68, Sabins teaches wherein the indicated amount of corrosion is in one of at least two different ranges (Col. 4, line 54-Col. 5, line 32).

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J. With respect to Claims 75-77, Sabins teaches a range of -1000 mV to below -585 mV (Col. 4, line 54-Col. 5, line 30) wherein the specific level is more negative than -900mV.

K. With respect to Claim 81, Sabins teaches a method comprising, measuring A potential which corresponds to a polarization of a tank, and measuring a current output of an instrumented sacrificial anode, the polarization and the measured current output together indicating an amount of corrosion of the tank and the level of coatings degradation, as stated above.

L. With respect to Claims 83 and 88, Sabins teaches a method and apparatus comprising, first means for measuring a potential which corresponds to a polarization of a tank, and second means for measuring a current output of an instrumented sacrificial anode, the polarization and the measured current output together indicating an amount of corrosion to the tank and the level of coatings degradation, as stated above.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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9. Claims 54, 55, 61, 67, 81, 82, and 88 are rejected under 35 U.S.C. §103(a) as being unpatentable over Rizzo (4,228,399).

A. With respect to Claim 54, Rizzo teaches an apparatus comprising, the claimed half cell measuring a potential (Col. 1, lines 4a-48) a pipeline, the measured potential indicating an amount of corrosion of the tank and the cathodic protection level of the tank (Col. 4, lines 55-66). Rizzo teaches using the device on a pipeline, and lacks the tank. To use the device on a tank is only one of numerous places one of ordinary skill in the art would have found obvious to monitor corrosion since both a pipeline and tank both are used to hold, transport or store liquids.

B. With respect to Claim 55, Rizzo teaches the claimed anode measuring a current demand of cathodic areas of a tank, the current demand indicating the amount of corrosion of the tank and the level of coatings degradation (Col. 5, lines 36-37).

C. With respect to Claim 61, Rizzo teaches an apparatus comprising, an anode measuring a current demand of cathodic areas, the current demand indicating an amount of corrosion of the tank (Col. 2, lines 8-12; Col. 2, lines 55-58; Col. 5, lines 36-37). As to the tank, one of ordinary skill in the art would have found it obvious for the reasons given in paragraph 6A, above.

D. With respect to Claim 67, Rizzo teaches an apparatus comprising, half cells measuring a potential which corresponds to a polarization (Col. 6, lines 45-48), and an anode measuring a current demand of cathodic areas of a tank, the polarization and the measured current demand together indicating an amount of corrosion of the tank and the level of coatings degradation (Col. 2, lines 8-12; Col. 2, lines 55-58; Col. 5, lines 36-37).,

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As to the tank, one of ordinary skill in the art would have found it obvious for the reasons given in paragraph 6A, above.

E. With respect to claim 81, Rizzo teaches a method comprising, measuring a potential which corresponds to a polarization (Col. 6, lines 45-48), and measuring a current output of an instrumented sacrificial anode (Col. 2, lines 39-40), the polarization and the measured current output together indicating an amount of corrosion to the tank and the level of coatings degradation (Col. 2, lines 8-12; Col. 2, lines 55-58; Col. 5, lines 36-37). As to the tank, one of ordinary skill in the art would have found it obvious for the reasons, given in paragraph 6A, above.

F. With respect to Claims 82 and 88, Rizzo teaches an apparatus and method comprising, first means for measuring a potential which corresponds to a polarization (Col. 6, lines 45-48), and second means for measuring a current output of an instrumented sacrificial anode (Col. 2, lines 39-40), the polarization and the measured current output together indicating an amount of corrosion to the tank and the level of coatings degradation (Col. 2, lines 8-12; Col. 2, lines 55-58; Col. 5, 36-37). As to the tank, one of ordinary skill in the art would have found it obvious for the reasons, given in paragraph 6A, above.

10. Claims 59, 60, 63-66, 65-71, 78-80, 83, and 84 are rejected under 35 U. S. C. §103(a) as being unpatentable over Sabins (4,107,017).

A. With respect to Claims 59, 60, and 69-71 Sabins lacks teaching that when the polarization is within a specific level, it indicates that the amount of corrosion is between a first



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first and second range of the one of at least two different ranges. Sabins teaches that the polarization is related to corrosion (Col. 6, lines 9-12). To compare polarization is only one of various measurements one of ordinary skill in the art would have found obvious in order to determine corrosion (Col. 4, line 54-Col. 5, line 32).

B. With respect to Claims 63-65, and 72-74 Sabins lacks teaching wherein the measured current output is within a specific level indicating that the amount of corrosion of the tank is between a first and second range of the one of at least two different ranges. To compare currents is only one of various measurements one of ordinary skill in the art would have found obvious in order to determine corrosion (Col. 4, line 54, Col. 5, line 32), since the amount of current is proportional to corrosion.

C. With respect to Claim 69, Sabins teaches an instrumented sacrificial anode which uses zinc (Col. 3, lines 47-49). To use ZHC-24 zinc is only one of various kinds of specific zinc materials one of ordinary skill in the art would have found obvious for the purpose of providing a material that has a more negative potential of electrochemical reaction.

D. With respect to Claims 78-80, Sabins lacks the specific level in mA. One of ordinary skill in the art would have readily recognize to use amperes instead of volts, in comparing levels is more dependent on the data collected.

E. With respect to Claims 83 and 84, Sabins fails to teach comparing the amount of corrosion of the tank with amounts of corrosion in other tanks, and determining which of the tanks requires maintenance. One of ordinary skill in the art would have readily recognized the advantage and desirability to compare corrosion in order to remove and repair the tank before a leak occurs.

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11. Claims 85-87 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

12. Applicant's arguments filed 9/17/03 have been fully considered but they are not deemed to be persuasive.

13. In the remarks the applicant art argued in substance that:

(1) Examiner has not provided the required analysis to meet the distinctness test for inventions.

(2) Sabins does not teach the capability to measure a current.

14. Examiner respectfully traverse applicant's remarks:

As to point (1), see paragraphs 3 and 4 above, Examiner provides for distinctness test:

I. Group I, claims 36-53 are drawn to a sensor system with reference, measuring and electronic modules, to determine environmental conditions by measuring material degradation properties, classified in class 205, subclass 775.5.

II. Group II, claims 54-88 (original claims 1-35) are drawn to an apparatus and method where the non-electric property of an object is measured by an electrical property such as a voltage or current of a sensor, classified in class 324, subclass 71.2.

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As to point (2), see paragraphs above, Rizzo does disclose a method comprising, measuring a potential which corresponds to a polarization (Col. 6, lines 45-48), and measuring a current output of an instrumented sacrificial anode (Col. 2, lines 39-40), the polarization and the measured current output together indicating an amount of corrosion to the tank and the level of coatings degradation (Col. 2, lines 8-12; Col. 2, lines 55-58; Col. 5, lines 36-37).

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter Benson whose telephone number is (703) 306-4525. The examiner can normally be reached on Mon to Fri 6:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on (703) 308-0750. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.

Walter Benson *WB*  
Patent Examiner

December 3, 2003

*N. Le*  
**N. Le**  
**Supervisory Patent Examiner**  
**Technology Center 2800**